

**WHAT IS CLAIMED IS:**

1 1. A computer implemented method of reclaiming memory  
2 occupied by Just-in-Time (JIT) compiled programs, said  
3 method comprising:

4 tracking a JIT compiled program, the tracking  
5 recording tracking data that includes a method name  
6 corresponding to the JIT compiled program and an  
7 address range that corresponds to the JIT compiled  
8 program;

9 discarding one or more memory pages included in the  
10 address range;

11 branching to an address included in one of the  
12 discarded pages, the branching resulting in a page  
13 fault;

14 retrieving the method name corresponding to the  
15 address that resulted in the page fault; and

16 executing a method corresponding to the retrieved  
17 method name.

1 2. The method of claim 1 wherein executing the method  
2 further comprises:

3 recompiling the method using a JIT compiler, the  
4 recompiling resulting in a replacement JIT compiled  
5 program stored at the recorded address range, wherein  
6 the executed method is the replacement JIT compiled  
7 program.

1 3. The method of claim 1 wherein executing the method  
2 further comprises:

3 removing the method name and the corresponding address  
4 range from the tracking data;  
5 retrieving an interpretable form of the method; and  
6 interpreting code included in the interpretable form  
7 of the method.

1 4. The method of claim 1 further comprising:

2 memory mapping the JIT compiled program from a  
3 nonvolatile storage location to the address range  
4 using a special filesystem;  
5 prior to the discarding, receiving, at the special  
6 filesystem, an instruction to write (to nonvolatile  
7 storage) the one or more memory pages that are about  
8 to be discarded; and  
9 returning a response indicating successful completion  
10 of the instruction without writing any of the pages to  
11 the nonvolatile storage location.

1 5. The method of claim 4 further comprising:

2 registering an error handler to handle a specific  
3 invalid operation code (opcode) prior to discarding  
4 any of the memory pages;  
5 in response to the page fault, calling the special  
6 filesystem to load the one or more discarded memory  
7 pages from the nonvolatile storage location;  
8 writing, by the special filesystem, one or more  
9 occurrences of the invalid opcode to one or more of  
10 the memory pages that were previously discarded; and

11 re-branching to the address that caused the page  
12 fault, the re-branching resulting in an invalid opcode  
13 exception.

1 6. The method of claim 5 further comprising:  
2 executing the error handler in response to  
3 encountering the invalid opcode, wherein the executing  
4 includes:  
5 retrieving the address range from the tracking data  
6 that includes the address that caused the page fault;  
7 retrieving the method name from the tracking data,  
8 wherein the retrieved method name corresponds to the  
9 address range; and  
10 re-compiling method code corresponding to the method  
11 name so that the re-compiled program is stored at the  
12 same address range as the original JIT compiled  
13 program.

1 7. The method of claim 6 further comprising:  
2 branching a third time to the address that caused the  
3 page fault, the branching performed after the re-  
4 compiling; and  
5 executing the re-compiled method code.

1 8. An information handling system comprising:  
2 one or more processors;  
3 a memory accessible by the processors;

4 a nonvolatile storage device accessible by the  
5 processors;

6 a virtual machine that includes a Just-in-Time (JIT)  
7 compiler loaded from the nonvolatile storage device to  
8 the memory and executed by the processors;

9 a memory reclamation tool for reclaiming memory  
10 occupied by JIT compiled programs, the memory  
11 reclamation tool including software code effective to:

12 track a JIT compiled program, the tracking  
13 including software code effective to record  
14 tracking data that includes a method name  
15 corresponding to the JIT compiled program and an  
16 address range that corresponds to the JIT  
17 compiled program;

18 discard one or more memory pages included in the  
19 address range;

20 branch to an address included in one of the  
21 discarded pages resulting in a page fault;

22 retrieve, from the tracking data, the method name  
23 corresponding to the address that resulted in the  
24 page fault; and

25 execute a method corresponding to the retrieved  
26 method name.

1 9. The information handling system of claim 8 wherein the  
2 software code effective to execute the method further  
3 comprises software code effective to:

recompile the method using the JIT compiler, the recompiling resulting in a replacement JIT compiled program stored at the recorded address range, wherein the executed method is the replacement JIT compiled program.

10. The information handling system of claim 8 wherein the software code effective to execute the method further comprises software code effective to:

remove the method name and the corresponding address range from the tracking data;

retrieve an interpretable form of the method; and

interpret code included in the interpretable form of the method.

11. The information handling system of claim 8 further comprising software code effective to:

memory map the JIT compiled program from a nonvolatile storage location to the address range using a special filesystem;

prior to the discarding, receive, at the special filesystem, an instruction to write (to the nonvolatile storage device) the one or more memory pages that are about to be discarded; and

return a response indicating successful completion of the instruction without writing any of the pages to the nonvolatile storage location.

1 12. The information handling system of claim 11 further  
2 comprising software code effective to:  
3 register an error handler to handle a specific invalid  
4 operation code (opcode) prior to discarding any of the  
5 memory pages;  
6 in response to the page fault, call the special  
7 filesystem to load the one or more discarded memory  
8 pages from the nonvolatile storage location;  
9 write, by the special filesystem, one or more  
10 occurrences of the invalid opcode to one or more of  
11 the memory pages that were previously discarded; and  
12 re-branch to the address that caused the page fault,  
13 the re-branch resulting in an invalid opcode  
14 exception.

1 13. The information handling system of claim 12 further  
2 comprising software code effective to:  
3 execute the error handler in response to encountering  
4 the invalid opcode, wherein the execution of the  
5 error handler includes software code effective to:  
6 retrieve the address range from the tracking data  
7 that includes the address that caused the page  
8 fault;  
9 retrieve the method name from the tracking data,  
10 wherein the retrieved method name corresponds to  
11 the address range;  
12 re-compile method code corresponding to the  
13 method name so that the re-compiled program is

14 stored at the same address range as the original  
15 JIT compiled program;  
16 branch a third time to the address that caused  
17 the page fault, the branching performed after the  
18 re-compiling; and  
19 execute the re-compiled method code.

1 14. A computer program product stored on a computer  
2 operable media for reclaiming memory occupied by Just-  
3 in-Time (JIT) compiled programs, said computer program  
4 product comprising:

5 means for tracking a JIT compiled program, the  
6 tracking recording tracking data that includes a  
7 method name corresponding to the JIT compiled program  
8 and an address range that corresponds to the JIT  
9 compiled program;

10 means for discarding one or more memory pages included  
11 in the address range;

12 means for branching to an address included in one of  
13 the discarded pages, the branching resulting in a page  
14 fault;

15 means for retrieving the method name corresponding to  
16 the address that resulted in the page fault; and

17 means for executing a method corresponding to the  
18 retrieved method name.

1 15. The computer program product of claim 1 wherein the  
2 means for executing the method further comprises:

3 means for recompiling the method using a JIT compiler,  
4 the recompiling resulting in a replacement JIT  
5 compiled program stored at recorded address range,  
6 wherein the executed method is the replacement JIT  
7 compiled program.

1 16. The computer program product of claim 1 wherein the  
2 means for executing the method further comprises:

3 means for removing the method name and the  
4 corresponding address range from the tracking data;

5 means for retrieving an interpretable form of the  
6 method; and

7 means for interpreting code included in the  
8 interpretable form of the method.

1 17. The computer program product of claim 1 further  
2 comprising:

3 means for memory mapping the JIT compiled program from  
4 a nonvolatile storage location to the address range  
5 using a special filesystem;

6 prior to the discarding, means for receiving, at the  
7 special filesystem, an instruction to write (to  
8 nonvolatile storage) the one or more memory pages that  
9 are about to be discarded; and

10 means for returning a response indicating successful  
11 completion of the instruction without writing any of  
12 the pages to the nonvolatile storage location.



1 18. The computer program product of claim 17 further  
2 comprising:

3 means for registering an error handler to handle a  
4 specific invalid operation code (opcode) prior to  
5 discarding any of the memory pages;

6 in response to the page fault, means for calling the  
7 special filesystem to load the one or more discarded  
8 memory pages from the nonvolatile storage location;

9 means for writing, by the special filesystem, one or  
10 more occurrences of the invalid opcode to the memory  
11 pages that were previously discarded; and

12 means for re-branching to the address that caused the  
13 page fault, the re-branching resulting in an invalid  
14 opcode exception.

1 19. The computer program product of claim 18 further  
2 comprising:

3 means for executing the error handler in response to  
4 encountering the invalid opcode, wherein the means for  
5 executing includes:

6 means for retrieving the address range from the  
7 tracking data that includes the address that  
8 caused the page fault;

9 means for retrieving the method name from the  
10 tracking data, wherein the retrieved method name  
11 corresponds to the address range; and

12 means for re-compiling method code corresponding  
13 to the method name so that the re-compiled

14                    program is stored at the same address range as  
15                    the original JIT compiled program.

1    20.    The computer program product of claim 19 further  
2           comprising:

3           means for branching a third time to the address that  
4           caused the page fault, the branching performed after  
5           performing the means for re-compiling; and

6           means for executing the re-compiled method code.